Appendix 5.1

Michigan DOT Research Summit

Breakout Group #1 – Safety

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1) How effective is MDOT's investment in safety programming and crash reduction? Conduct before-and-after studies, looking at all previous studies.

Specific problem to address, question to answer or information needed
Why crashes happen and crash reduction in work zones. Are we collecting the right data? Data collection techniques and advancements. How effective our countermeasures DOT is implementing, such as rumblestrips? Center line **rumble strips** and **cable barriers**—new implementations with assumption of safety benefits. Where best to apply these? Consider incorporating multiple disciplines in study, such as effect on pavements. **Flashing yellow arrows** for permissive left turn at intersections. Safety investment that depends on time of return on investment. Look at cost of fatalities, etc. and factor into decisions about which safety-oriented transportation projects to fund. Increased investment recently in this area but it's difficult to measure effectiveness of program. Consider three-year analysis before and after new program implemented. (Larry) Pedestrian safety work underway now in Detroit that could be evaluated. **Roundabouts.** **See rumble strips and roundabouts topics in Mobility and Renewal & Sustainability.**
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
Consider three-year analysis before and after new safety investment program implemented. Before and after study to look at impact of rumble strips on safety as well as on pavement. Consider other impacts as well, such as how people drive, operations in passing zones, and much more.
Expected implementation of results and benefits for MDOT
Save lives Prioritize funding decisions Know what works and what doesn't work Inform legislators with Michigan-specific results. Guidelines on implementation of safety countermeasures.

Appendix 5.1

Michigan DOT Research Summit

Breakout Group #1 – Safety

2) What is the behavioral component of crashes, and how can education money be directed to minimize these crashes? What will be most cost effective?

Specific problem to address, question to answer or information needed
Pedestrian-bicycle crashes both looking at driver and rider. Mentality of drivers who choose to drive around gates at crossings. Installing devices to evaluate behavior. Where to commit money—advanced enforcement worthwhile to prevent problems or educating younger people, etc.? Multi-car crashes in bad weather. Driver distraction Pre driving behaviors (lack of sleep, alcohol, drugs). Motorcycle safety—fatalities keep going up. Issue of riders knowing how to ride and drivers knowing how to driver around them. Roundabouts—drivers, pedestrians
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
Look at crash reports, tickets written, officer reports. Use simulation tools. Survey of drivers—do you go around the gates? Get better handle on where problems happening. Understand audience (target group) and best approaches to reach and influence them. Behavior studies can be very sensitive—invasion of privacy potentially, unwilling to talk Motorcycles—focus on driver education curriculum. Look at amount of time spent on motorcycles. Get Secretary of State involved. Focus on educating parents who will influence and guide children who are new drivers.
Expected implementation of results and benefits for MDOT
Funding decisions and priorities. Changes to driver ed materials Strategic Highway Safety Plan changes/modifications

Appendix 5.1

Michigan DOT Research Summit

Breakout Group #1 – Safety

3) How can MDOT improve safety techniques, materials and equipment? The department should look into current practices and ways to improve.

Specific problem to address, question to answer or information needed
Worker safety—less hazardous materials, better equipment for protection Innovative pavement marking and sign materials. Are they cost effective, reduce crashes, improve visibility. Some pilot programs already out there—could evaluate. Crash scenes and role of first responders. Nighttime crashes. Are police cars enough? Do they hide workers when crashes occur in work zones? Flaggers. Instructed to stand only (no sitting, leaning, etc.) Look at extent of problem and how to combat it. Identify current techniques and look for areas of improvement. Deicing materials
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
Study pilot materials in place for effectiveness. Before and after studies. National Traffic Incident Response Coalition looking at incident response. In Europe countries have well orchestrated responses, standardization of flashers, etc. National best practices to consider. Flaggers—look to other states' practices and successes.
Expected implementation of results and benefits for MDOT
New guidelines on implementation of materials and techniques. Reduce number of workers injured/killed. New training programs and videos to certify flaggers. Reduce the number of secondary crashes. Improve mobility.

Appendix 5.1

Michigan DOT Research Summit

Breakout Group #1 – Safety

4) How can the federal-state partnership for state safety system oversight of rail transit be improved?

Specific problem to address, question to answer or information needed
Responsibilities for oversight is with the states. MDOT newly assigned this role for Michigan by FTA and lacks technical expertise in this area. Lack staffing for oversight over next two or three years. FTA provides training but not as much as needed. Need to better understand range of responsibilities. Identify what skills are needed in new hires or consider outsourcing.
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
Survey other states to understand their practices and document best practices. Define and document oversight responsibilities and develop action plan.
Expected implementation of results and benefits for MDOT
Recommendations for oversight. Hiring recommendations.

Appendix 5.1

Michigan DOT Research Summit

Breakout Group #1 – Safety

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5) How do Intelligent Transportation Systems and Vehicle Infrastructure Integration (VII) tie together? Can cars be designed that "can't crash?" ***(Identified as a long-term need.)***

Specific problem to address, question to answer or information needed
Trust is an issue. Could a driver trust the automation? Will take a lot of money nationally, especially on VII side. Automobile makers will have to focus on this. What is the torte liability of implementing these—who is responsible for a crash? Concern about over reliance on automation. Transmission of signal data to driver (notification of when light will change). Are there safety issues with this? Is this a positive or negative—benefits and costs? Is this a security issue? Transmission of data from driver may be a security or personal privacy issue. How do you promote the new technology given unwillingness to share data? How do you convince people it's not just big brother watching them. Look at how we can utilize information being gathered through VII for improving crash rate. Will drivers expect VII to work on all roads? If not, do you have to notify drivers on the road when it's available or not available? What concerns are there related to driver education and dependence on VII? Who is responsible for notifying drivers about road technology being there—the DOT? Are there alternatives to VII? Maybe focus on people. Send information though cell phones, for example. Cell phone could integrate with car to hold your data.
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
Investigate legal issues as they relate to crashes and VII. Are there laws now that would address these situations specifically in Michigan? Develop some possible marketing approaches for selling the technology as a benefit and not a privacy infringement. Survey public opinion about technology/conduct focus groups about how they feel about the technology.
Expected implementation of results and benefits for MDOT
Marketing plan to roll out when technology ready. Influence funding decisions—fund technologies that public is more receptive to.

Appendix 5.1

Michigan DOT Research Summit

Breakout Group #1 – Safety

6) Messaging, traffic control, signage, pavement marking, etc. How are we doing?

Specific problem to address, question to answer or information needed
Rerouting of traffic when highway shut down due to emergencies/incidents. Look at better messaging or more efficient approaches—warn people earlier. How quickly can you create a detour? Improvements to changeable message signs. Use for more than public awareness messages. This is an operating issue. What are barriers for keeping them current and useful? Use of super bright LED billboards for messaging? They're used now for public service announcements. Local road issues Apply countermeasures at local level and study cost effectiveness Ask counties what research needs they have. Look to Mn/DOT's LRRB program. Signage issues Exit lanes. Exit only and exit okay next to each other could use better advance information to manage the traffic in the two lanes.
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
Expected implementation of results and benefits for MDOT

Appendix 5.2

Michigan DOT Research Summit

Breakout Group #2 – Renewal and Sustainability

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1) What is most efficient size of a transportation agency? What activities should be included in the DOT? Should the department consider combining regional and local agencies regardless of jurisdictional boundaries?

Specific problem to address, question to answer or information needed
• Fluctuating economy, uncertainty of program size and what activities/services should be included • Define what we mean by "efficient" or "optimal" • How is MDOT going to sustain the research program with staff it already has • What are the core competencies needed to provide acceptable service • What is the role of the DOT compared to the local/regional agencies • What is the smallest MDOT can be without losing federal aid and provide services and continue to provide an integrated transportation system
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
• Collection of state and federal regulations to receive federal aid - federal requirements • Interview/research other DOTs best practices, sizes, functions – identifying creative collaborations/partnerships • Unique requirements (i.e., marine, climate, international borders) • Collect and analyze cost data from Michigan and other DOTs
Expected implementation of results and benefits for MDOT
• Change size of MDOT if needed to become the most optimal • Document what would support future activities relative to organizational structure • Improve customer satisfaction, roads

Appendix 5.2

Michigan DOT Research Summit

Breakout Group #2 – Renewal and Sustainability

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2) What new, low cost construction materials can researchers develop that are durable in Michigan's climate?

Specific problem to address, question to answer or information needed

• Need to find materials and methods that provide the best performance for the least cost (initial as well as life cycle cost)
• Materials should be durable – less maintenance (life cycle cost)
• How to define "durable"
• What are the materials properties
• Other construction materials including some additives to the existing materials in Michigan available other than traditional materials (asphalt, concrete)
  • Fibers
  • Bendable concrete
  • Epoxy
  • Polymers
• Readily available materials
• MDOT needs to define what "sustainability" means to them
• How do today's decisions impact sustainability in the future
• Political implications

Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
• Systematically evaluating materials (new and current) • Exhaustive literature search of construction materials • Balance between cost, performance, and societal impacts • MDOT needs to define the optimal balance • Network wide uniformity • Differentiate between theoretical vs. applied
Expected implementation of results and benefits for MDOT
• More durable transportation infrastructure • More durable and cost effective • Different specifications for certain materials, provide incentives • Less traffic delay due to fewer construction projects

Appendix 5.2

Michigan DOT Research Summit

Breakout Group #2 – Renewal and Sustainability

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3) How can MDOT build maintainable structures and roadways that last longer? Possibilities include alternative materials that are lower in cost as well as alternative design and contracting approaches.

Specific problem to address, question to answer or information needed
• How to pick the right material, smart and cost-effective design, use the right construction method • How to design the optimum structure • Is long life synonymous with sustainability • Define what factors contribute to premature deterioration • What properties, characteristics contribute to longevity • What are these two points worth to MDOT • How to mitigate existing problems • Other contracting methods that can give a better value • What is the best tradeoff of maintenance practices
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
• Lab testing and test sections • Pooled funds • Development of mechanistic models • Interview other DOTs and contracting community
Expected implementation of results and benefits for MDOT
• Development of new standards and specifications for design, construction, and maintenance • Test sections • Implementation guide • Trial contracting – pilot programs

Appendix 5.2

Michigan DOT Research Summit

Breakout Group #2 – Renewal and Sustainability

4) Is the state better off using or not using bonds for financing?

Specific problem to address, question to answer or information needed
•
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
•
Expected implementation of results and benefits for MDOT
•

5) What new sustainable materials can be used for sustainable transportation? Through reusing materials and using longer-life materials, can MDOT accomplish a 0% waste stream?

Specific problem to address, question to answer or information needed
• Environmental concerns relative to sustainability   • Does 0% waste stream mean minimal environmental pollution • Goes back to the point of what is MDOT's definition of sustainability • How does MDOT reduce its waste • How does MDOT define its waste stream • What obligation do we have to utilize commercial waste • How does recycling and sustainability impact mobility, production, and long term performance • How do we come to consensus with other environmental agencies
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
• List and catalog potential waste • Lab testing and test sections • Literature search • Greater stakeholder communications
Expected implementation of results and benefits for MDOT
• To use results as a benchmark for waste levels • To understand current waste levels • Establish MDOT as a leader • Minimize MDOT's carbon footprint • Enhances MDOT's environmental stewardship • Differentiate impact to low and high volume traffic roads • Define MDOT's limitations • Catalyst for non-MDOT organizational adoption

Appendix 5.2

Michigan DOT Research Summit

Breakout Group #2 – Renewal and Sustainability

6) Considering return on investment for any transportation project, how does MDOT make tradeoff decisions for the greatest economic benefit?

Specific problem to address, question to answer or information needed
• How do we overcome the status quo (cost performance ratio) • Put a price tag on alternatives (environmental, cost, performance and societal impacts) • What is it worth and how do we measure them consistently • Who is our audience
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
• Focus groups pertaining to key stakeholders, politicians, general public, regional • Literature review • Economic analysis of the tradeoffs
Expected implementation of results and benefits for MDOT
• Paradigm shift • Flowchart, process map, matrix, decision tree pertaining to transportation program development • Environmental awareness

7) What would be the effectiveness of a rumble strip program on non-freeways?

Specific problem to address, question to answer or information needed
• What is the balance of the performance centerline longitudinal joints in comparison to a reduction in cross-over accidents • How will maintenance be effected of centerline rumble strip
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
• Research new rumble strips • Test section • Compare accident history for deteriorating centerlines
Expected implementation of results and benefits for MDOT
• Help us identify criteria on where to install centerline rumble strips • How to repair deteriorating rumble strips • Justification for increasing longitudinal joint density requirements (HMA)

Appendix 5.3

Michigan DOT Research Summit

Breakout Group #3 – Renewal and Sustainability

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1) What are promising new materials and methods for construction and maintenance? Possibilities include rapid construction and new pavement materials to avoid dependency on fossil fuels.

Specific problem to address, question to answer or information needed
Methods: Rapid de-construction/demolition of bridges and structures methods to decrease expense of rerouting traffic and decrease time involved. (Look for recycling opportunities.) Develop effective methods for doing rapid deck replacements for parabolic T-beam bridge decks. Develop new rapid construction technologies. New pre-fabricated materials and uses. New information technologies to keep track of detailed construction details of our current infrastructure (bridges, foundations, rebar & concrete, etc.). New non-destructive evaluation techniques of bridges and pavements. Investigate better pre-casting options for bridge structures in consider mobility of castings.
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
Sequence of deconstruction. Evaluated the systems that are there/bridge types match deconstruction to them. Identify planned revisions/develop specifications for contractor. Implement the best way to deconstruct a bridge during the design phase and include in the implementation plan. May be able to save parts to decrease the actual demolition of structure for reuse/anticipate impacts of demolition methods used. New simulation techniques to show effects of demolition methods. Study impact of demolition on surrounding man made structures/vibrations through soils. Simulation with Refined analysis then confirmation during various phases of the deck replacement to develop possible methods.
Expected implementation of results and benefits for MDOT
Both: Mobility policy and cost savings, safety

Appendix 5.3

Michigan DOT Research Summit

Breakout Group #3 – Renewal and Sustainability

2) What are best practices for reviewing materially unbalanced bids?

Specific problem to address, question to answer or information needed
Develop a multi-variant optimization program/routine to scan a standard MDOT proposal, broken down by item to identify materially unbalanced bids.
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
Do some data mining of best practices. Develop averages/boundaries/identify targets to define acceptable limits. Compare engineer's estimate to lowest 3 bids. Investigate where the unbalance occurs. Software to capture trends by contractor. Document extent of the problem.
Expected implementation of results and benefits for MDOT
Save money. Improve cash flow for Department.

Appendix 5.3

Michigan DOT Research Summit

Breakout Group #3 – Renewal and Sustainability

3) What alternative design and contracting approaches will lower costs?

Specific problem to address, question to answer or information needed
Investigate design-build-operate. Investigate alternative design options for the structures of our roads and bridges. Is there a better option for the structures? Investigate better pre-casting options for bridge structures in consider mobility of castings. Investigate durable joints for pre-cast systems.
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
Evaluate design-build-finance already occurred/ in process to come up with possibilities. Are we ahead or behind. Investigate research funded from other sources, invite researchers to MDOT to share findings. Investigate other collaborative options between research facilities and MDOT to expose possibilities that may not otherwise be investigated.
Expected implementation of results and benefits for MDOT

Appendix 5.3

Michigan DOT Research Summit

Breakout Group #3 – Renewal and Sustainability

4) What are the most promising alternate paving materials?

Specific problem to address, question to answer or information needed
Investigate new and modified materials with higher performance and less cost, more sustainability, reducing carbon footprint, crack resistant, ductile. Important that it is Michigan specific.
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
Research other best practices in other DOTs and industries. Research other countries with similar climates and conditions. Lab testing, comparing to current materials. Test under the extreme environment conditions/field. Test road. Do life cycle cost analysis.
Expected implementation of results and benefits for MDOT
Savings in time, and long-term cost savings,

Appendix 5.3

Michigan DOT Research Summit

Breakout Group #3 – Renewal and Sustainability

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5) How can MDOT address system preservation?

Specific problem to address, question to answer or information needed
Developing probability based deterioration models for pavements and bridges (structure and drive quality). Develop continuous monitoring of periodic work done on infrastructure by non-MDOT entities (quality and methods vary). Investigate ways to insure compliance of utility companies, etc., to MDOT standards. Develop state-wide standards for fixes/refine current system of what fix needs to be done when.
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
Data collection analysis. Establish data set that links design, construction, and performance measures.
Expected implementation of results and benefits for MDOT
Enhancement of the management systems for bridges and pavements.

6) How can MDOT address system integration, which will become a bigger issue as public transportation system grows? Vehicle and equipment issues need to be considered.

Specific problem to address, question to answer or information needed
Agreed that this topic is not appropriate for this group.
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
Expected implementation of results and benefits for MDOT

Appendix 5.4

Michigan DOT Research Summit

Breakout Group #4 – Organizational Effectiveness

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1) What are the national best practices on structuring and funding regional transportation systems?

Specific problem to address, question to answer or information needed
Are we behind other states/regions in our use of transit? (e.g., DC, NY, Portland) Light rail, bus and rapid transit are often planned and operated regionally rather that by city. Detroit is an example of two operators that don't work together. Also: What is the best way to manage this coordination? How does MDOT define its role and structure itself to influence the final systems and stay involved along the way?
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
• Conduct a study on historic public transportation systems in Michigan. Why did they work; why did they change? • Scan transit systems worldwide. How do they work? How are they funded? Can these solutions apply to Michigan? • Examine in the process problems unique to Detroit. Does its problems transcend transportation (i.e., is there a fundamental reason the parts of the city don't work together and how can larger issues be solved)? • Synthesize existing studies (in the last few years) on Michigan locales, routes and corridors. These look at operational factors, routes, and population segments served.
Expected implementation of results and benefits for MDOT
• Improved transit service to all citizens. • Improve quality of life (ease, convenience, mobility). • Create jobs by helping transport people to work. • Other Economic benefits.

Appendix 5.4

Michigan DOT Research Summit

Breakout Group #4 – Organizational Effectiveness

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2) What are the best public/private partnerships for construction, interconnections on modes, and maintenance?

Specific problem to address, question to answer or information needed
How to can an public/private partnerships (such as the intermodal connector) foster economic growth?
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
Define, study and quantify the best measures that indicate benefits to the economy.
Expected implementation of results and benefits for MDOT
• Improved economy. • New jobs created through these kinds of partnerships.

Specific problem to address, question to answer or information needed
How can MDOT get more (or better) public/private partnerships in everything that it does?
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
• Conduct a study to identify tangible and intangible benefits, which can then be shown to private entities. • Conduct a study on best practices: how to be more open/accessible/flexible, and how to be proactive (get MDOT involved early so that a new job site is located at a place workers can get to?) • Conduct life-cycle models (such as on design-build-maintain that might become a burden to the public at the end) to really know what each party is getting, and what each party should pay. • Look at Parsons study at FHWA (use of tolls and other public/private model). Major funding may be available through these methods to get very large projects going. Conduct a feasibility study and collaborate with existing task force to see how these kinds of partnerships are actually run and managed.
Expected implementation of results and benefits for MDOT
More and better public/private partnerships.

Specific problem to address, question to answer or information needed
How can MDOT get involved and address major deficiencies (e.g., DTW) from air to ground?

Appendix 5.4

Michigan DOT Research Summit

Breakout Group #4 – Organizational Effectiveness

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3) How can MDOT coordinate delivery of services to the aging? This includes program development and delivery at the state and local levels and coordination with health services. This issue is closely connected to "mobility management."

Specific problem to address, question to answer or information needed
What are cost-effective methods to address this issue? What are the best ways to coordinate this at MDOT?
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
Review of existing approaches, particularly low-cost approaches (such as increased size on fonts). Find needed concentration areas based on demography studies. Conduct a state of the art survey: what is already advanced (this will help more effectively identify issue).
Expected implementation of results and benefits for MDOT
A plan to put the measures in place effectively in the right places for the population.

Specific problem to address, question to answer or information needed
How is the state DOT Planning and Operation addressing changing state demographics/population shifts? How is dependency on a particular mode changing?
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
Gather data from organization on how people are changing habits as they age? What are they doing differently as they age. (Such groups might be: Center for Aging, Secretary of State, AARP).
Expected implementation of results and benefits for MDOT
Inventory of services and extrapolate how they might change.

Specific problem to address, question to answer or information needed
Are there ways to allow people to drive safely longer, or provide alternate services for transportation?
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
Conduct a study to determine whether it's *driving* or *mobility* that correlates to quality of life? Survey to find out alternative mobility options/preferences, and then how best to integrate needs. What are the neighborhood shifts (corner stores to megastores) and how do they impact this issue?
Expected implementation of results and benefits for MDOT
Establish standards to address alternate mobility needs/challenges. How do the finding impact decisions in the design/planning for trip generations in the future?

Michigan DOT Research Summit

Breakout Group #4 – Organizational Effectiveness

Specific problem to address, question to answer or information needed
Passengers with limited mobility can't get on regional jets and small aircraft.
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
Examine and improve aircraft design standards and future design standards.
Expected implementation of results and benefits for MDOT
Changes to standards.

4) How can MDOT's performance be measured? Methodologies may be developed on a variety of topics.

Specific problem to address, question to answer or information needed
How does MDOT know it's hitting the right targets and that results are meeting expectations? What are the metrics for MDOT's performance? There is a need for measurable parameters.
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
Identify and list metrics (looking also at existing methodologies): • Perception studies • Objective metrics (miles of road paved, amount of cost savings). Adapt to MDOT's specific domain (and look at MDOT-specific areas that others might not use). Correlate and verify to see what's meaningful. Compare results with desired outcomes. Use factor analysis → 20% of the issues that affect 80% of the system.
Expected implementation of results and benefits for MDOT
Share results with users of MDOT's services; improve things that need improvement with a higher focus and use a continual process to improve.

Specific problem to address, question to answer or information needed
How can MDOT improve in a single performance measure (e.g., getting 90% of roads and bridges in 10 years)?
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
Use benchmarking against another comparable state. This can be an asset management-based approach.
Expected implementation of results and benefits for MDOT
Highly targeted improvements.

Specific problem to address, question to answer or information needed
Other problems: How is collected data collected fed back into the system? How to measure MDOT as an agency versus the performance of the transportation system?

Appendix 5.4

Michigan DOT Research Summit

Breakout Group #4 – Organizational Effectiveness

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5) What peer exchanges (either sponsored at MDOT or attended by MDOT) can MDOT use to learn best practices and then incorporate these practices?

Specific problem to address, question to answer or information needed
If one attends a peer exchange, what report-back is expected? How can participants return value?
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
• Put together procedures for possible new benefits for implementing/mainstreaming. • Develop methodologies for recording what happened; have participants come with an objective (what they want to get out of it) and report back on key ideas learned. • Develop incentives for participation to get good results.
Expected implementation of results and benefits for MDOT
New concepts will enter the mainstream at MDOT.

6) What is the cost/benefit of participating in a federal opt out program?

Specific problem to address, question to answer or information needed
By opting out of federal oversight, Michigan would give up ~5% of dollars.
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
Conduct a benefit/cost analysis of doing this up. What is oversight really costing (to deal with FHWA)? • An analysis throughout the department, including the cost of time saved (federal cost/review, including opinions from different groups within FHWA) • Discover what benefit is *lost* by opting out? (money as well as intangibles → is being disconnected from the Feds a loss of opportunity?) • What are the added risks of being a "Guinea pig"? • What are the costs of opting back in? Conduct a before/after study on whether this was a good idea? Is Michigan better off? GAO data may help inform this study.
Expected implementation of results and benefits for MDOT
Informed choice on whether or not to opt-out. (Or keep opting out, if this is a temporary decision)

Appendix 5.4

Michigan DOT Research Summit

Breakout Group #4 – Organizational Effectiveness

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7) What is the fiscal impact of federal regulations for labor and contracting on transportation projects?

Specific problem to address, question to answer or information needed
Per state prevailing wage act (Michigan) and Davis-Bacon Act (federal), there are major differences in pay between local and state/federal jobs. Local jobs may cost less, but they also pay less: is the balance right? Another problem: frequent rate changes (day-to-day) mean that workers have no way to verify if they're being paid correctly.
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
Run an optimization study to assess parameters for balancing economic development (put more money into the economy and create jobs) balanced with spending. Tradeoff analysis → what might be the benefits of one consistent rate, such as a compromise "middle rate".
Expected implementation of results and benefits for MDOT
Best approaches for structuring pay.

8) How can state-federal-local partnerships be improved so that federal policy agendas can be delivered with less government-to-government oversight? This is of particular importance in transit, where both the federal government and state government pass funding through to local government. Too many resources are spent on government-government oversight at all levels. ***(Identified as a long-term need.)***

Specific problem to address, question to answer or information needed
What does our oversight of local government cost?
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
Conduct a benefit/cost study for a parallel program to the federal opt-out program: allow local governments to opt out of state oversight. Expected cost savings include staff levels and processing time. Assess also what is lost (such as system-wide data collection). Include a needs analysis: what is being done because "we have always done it" and not "because we need to." Assess what oversight needs to be eliminated (redundant) vs. kept (protect the public). How do streamline but keep accountability. Study alternate accountability modeling (such a formalized plans like the FAA oversight model).
Expected implementation of results and benefits for MDOT
Less cost with the right amount of oversight.

Appendix 5.4

Michigan DOT Research Summit

Breakout Group #4 – Organizational Effectiveness

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9) What is the impact of land use policies on DOTs? *(Identified as a long-term need.)*

Specific problem to address, question to answer or information needed
MDOT doesn't make land-use decisions but is affected by them. Land use may be incompatible (zoning issues — neighborhoods next to airports)?
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
Explore approaches to getting MDOT at the table with the decision-makers. MDOT can provide input and expertise. Use a collaborative approach (follow the same kind of approach as context-sensitive design).
Expected implementation of results and benefits for MDOT
Better decisions can be made for land use.

Specific problem to address, question to answer or information needed
Other problems: Land use is a moving target – people aren't willing to live as far from the city with gas price. How does MDOT address the national move toward traditional neighborhoods. Is expanded right-of-way an advantage for improved land-use?

Appendix 5.5

Michigan DOT Research Summit

Breakout Group #5 – Organizational Effectiveness

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1) What best practices do DOTs use to leverage federal aid?

Specific problem to address, question to answer or information needed
• Where is the funding match coming from (private entities, non-state government) • In-Kind Matching • Generate more funding • Unused Federal Aid • Are we utilizing all federal aid funding? • Align with federal priorities • How can MDOT better leverage their federal aid? • What would the public's reaction be to an increase in the gas tax, other taxes, toll roads, etc.?
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
• Approach this as a synthesis • Survey other stakeholders, DOT's • Benchmarking • Public opinion towards raising taxes • Locate existing research, data, documentation • Explore alternative revenue sources • Identify variables in the federal aid formula that we can influence to increase our federal aid amount (Michigan is a donor state)
Expected implementation of results and benefits for MDOT
• Never leave federal aid funds untapped • Development of a new process for identifying more state aid • What is the additional funding going to be used for • Generate new legislation (new tax, policy changes)

Appendix 5.5

Michigan DOT Research Summit

Breakout Group #5 – Organizational Effectiveness

2) What is the impact of leadership development programs in improving organizational effectiveness?

Specific problem to address, question to answer or information needed
• Leadership development and training are the first items cut when budgetary issues arise • Increase morale and increase employee productivity • Retention of good employees • Communication skills, interpersonal relationships, teamwork are all increased through leadership development programs • What is the return on the investment • Justification
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
• Approach this as a synthesis • Survey other stakeholders, DOT's, similar organizations • Benchmarking • Locate existing research, data, documentation
Expected implementation of results and benefits for MDOT
• Increase morale and increase employee productivity • Retention of good employees • Communication skills, interpersonal relationships, teamwork are all increased through leadership development programs • Develop and pilot a leadership development program • Restore the leadership development

Appendix 5.5

Michigan DOT Research Summit

Breakout Group #5 – Organizational Effectiveness

3) How do DOTs ensure that they use qualified and fiscally solvent contractors?

Specific problem to address, question to answer or information needed
• Determine if our selection process is "as good" as it can be • Value-based selection process versus cost
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
• Survey DOT's to see how they select contractors • Identify parameters that show contractor's qualifications • Performance warranties • Define performance criteria and have appropriate language to reinforce • Update and review current research data
Expected implementation of results and benefits for MDOT
• Review MDOT's practices against other DOT's • Ensure stakeholders are not negatively impacted by poor performing contractors • Determine the process for pre-qualifying/selecting internally or externally

Appendix 5.5

Michigan DOT Research Summit

Breakout Group #5 – Organizational Effectiveness

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4) What are the dynamics in the commercial air service industry (such as passenger and fuel issues)? How can the focus shift to achieving high return on investment versus pursuing low costs?

Specific problem to address, question to answer or information needed
•
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
•
Expected implementation of results and benefits for MDOT
•

Appendix 5.5

Michigan DOT Research Summit

Breakout Group #5 – Organizational Effectiveness

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5) What are the rail freight and rail passenger needs in Michigan? How can state resources best resolve issues with current rail configuration?

Specific problem to address, question to answer or information needed
• A rail system is needed for both passenger and commercial use statewide
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
• Identify existing corridor that are up standards, need improvement, • Coordinate public efforts with the private rail companies for collaboration • Feasability study of impact of lost revenues due to less fuel consumption
Expected implementation of results and benefits for MDOT
• Decrease highway traffic (congestion, crashes, casualties, maintenance cost) • Reduce pollution • Rail systems are more durable than roads • Cost of commuting would decrease • Less wear and tear on highway

Appendix 5.5

Michigan DOT Research Summit

Breakout Group #5 – Organizational Effectiveness

6) What is the role of the private sector in the development of passenger facilities?

Specific problem to address, question to answer or information needed
• Who is the private sector • How do entice private companies to build transit systems and bring additional revenue sources with their agency from private development •
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
• Approach this as a synthesis • Survey other stakeholders, DOT's, similar organizations • Benchmarking • Locate existing research, data, documentation
Expected implementation of results and benefits for MDOT
• Leveraging state and federal funds with private money • Private sector could make it happen faster • Stakeholder satisfaction • Allows for more innovate solutions to be implemented

Appendix 5.5

Michigan DOT Research Summit

Breakout Group #5 – Organizational Effectiveness

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7) What are the economic benefits of transit? Consider benefits at state and local levels.

Specific problem to address, question to answer or information needed
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
Expected implementation of results and benefits for MDOT

8) How can MDOT best configure its staff? Public/private partnerships should be considered. ***(Identified as a long-term need.)***

Specific problem to address, question to answer or information needed
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
Expected implementation of results and benefits for MDOT

Appendix 5.5

Michigan DOT Research Summit

Breakout Group #5 – Organizational Effectiveness

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9) What is the optimal amount of money MDOT should spend on technology? This includes technology applied to the transportation system (such as ITS and VII) as well improvements to the office environment. The agency should look at other states. ***(Identified as a long-term need.)***

Specific problem to address, question to answer or information needed
• What is optimal • What the methodology to determine what's optimal • What's technology • Energy efficiency • Practical application/test before adopting software • Legacy cost versus initial investment
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
Expected implementation of results and benefits for MDOT

Appendix 5.6

Michigan DOT Research Summit

Breakout Group #6 – Mobility

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1) How can technology alleviate congestion? One technology to consider is VII. ***(Identified as both a short-term and long-term need.)***

Specific problem to address, question to answer or information needed
• Recurring and non-recurring events • Predictable and non-predictable • Existing data • Driver response to information • Increased motorist expectations • Lack of alternatives • Timeliness of data • Accuracy of information • Financial cost of solutions • Data delivery and display to users
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
• VII provide real time data • Define VII products • Define existing data • Identify data gaps • Define the hardware/software system (user friendly) • Focus groups/user surveys • Literature searches • Simulation studies
Expected implementation of results and benefits for MDOT
• Improved on-time delivery service • Improved air quality • Decreased use of fuel • Improved assessment of system condition • Optimize capacity of existing system • Increased public satisfaction • Decrease need for additional road construction

Appendix 5.6

Michigan DOT Research Summit

Breakout Group #6 – Mobility

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2) What are the demographic impacts of an aging Michigan population on the transportation system? The lack of travel options affects the quality of life for the elderly

Specific problem to address, question to answer or information needed
• Impact of aging on capacity (driving slower) • Existing systems will not accommodate travel modes in the future • Travel patterns change • Type of services available/needed urban/rural locations, transportation services • Connectivity of modes • Visual and operational instruction to meet elderly needs (signage)
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
• Use of GIS data • Modeling/survey of future travel and residency patterns • Seasonal travel patterns • Interview health providers, social workers, and other service providers for elderly needs • New material and technology research
Expected implementation of results and benefits for MDOT
• More seniors living in Michigan not moving out of state • Increased safety and mobility • Good for seniors, trickle down to younger generation • Better finance assessment between transportation modes • Stable tax base

Appendix 5.6

Michigan DOT Research Summit

Breakout Group #6 – Mobility

3) How will MDOT provide traveler information? What information does the public want, and how will it be used?

Specific problem to address, question to answer or information needed
• What information is provided by public vs private • Purpose for travel information ie vacation, work, seasonal • Generate tourist spending • Not fully meeting the needs and format for the traveling public • Identify flexible systems for future needs
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
• Links with other website tools • What's going on in the commercial world • Survey wants vs needs • Identify data gaps • Coordinate research with DNR and Travel Michigan • Best practices public and private
Expected implementation of results and benefits for MDOT
• Increased customer satisfaction • Repeat traveler • Improved system usage • Current traveler stays longer • Return on investment

Appendix 5.6

Michigan DOT Research Summit

Breakout Group #6 – Mobility

4) How can MDOT improve incident management? This issue should be addressed in light of upcoming legislation on quick clearance.

Specific problem to address, question to answer or information needed
• MDOT needs to know where incident occurred • Cell phone usage • Emergency response coordination • Congestion avoidance • Infrastructure ability to handle bump-outs and pull-outs • Include in driver education instruction, new and renewed • Pavement condition awareness • Driver warnings • Awareness of events, predictable • Cost analysis for end user • Goals for clearance…minimal time
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
• Use existing accident data bases • Potential for VII • Localized infrastructure improvements • Partnership engagements • Benchmark best practices • Contractual needs with local vendors ie tow trucks
Expected implementation of results and benefits for MDOT
• Less congestion • Reduced user cost • Less CO2 emissions • Increased travel time reliability • Better utilization of existing resources • Improved safety

Appendix 5.6

Michigan DOT Research Summit

Breakout Group #6 – Mobility

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5) What is the performance and effectiveness of roundabouts that are currently in place?

Specific problem to address, question to answer or information needed
• Don't know the effectiveness of roundabouts • Applicable use • Pedestrian accommodation • Education of users • Cost benefit analysis • Single lanes vs multiple lanes • Urban vs rural • Designer knowledge on correct design of roundabouts
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
• Best practice (international and national) • Before and after studies • Look at past roundabouts • Content analysis of newspapers • Driver behavior study
Expected implementation of results and benefits for MDOT
• Better usage and design of roundabouts • Greater driver acceptance • Improved neighborhood aesthetics • Improved air quality • Reduction in accidents • Improved traffic flow • Potential pedestrian impact + or –

Appendix 5.6

Michigan DOT Research Summit

Breakout Group #6 – Mobility

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6) How can MDOT use technology to improve transportation planning? Develop and test new data collection methods, such as remote sensing and VII.

Specific problem to address, question to answer or information needed
• Get origin and destination information • Reliable and accurate information • Privacy issues- Personal data information • Link between local planning and land use development • Global review • Integration of data systems • Authority issues, national, state, local • Funding flexibility cost constrained • Burdensome regulations
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
• Segmentation of problems – phased approaches • Data collection, analyses • Economic studies • Develop commonly acceptable data • Public vs private movement • Increase partnership develop potential charters • Best practices • Identify required data, meaningful measures
Expected implementation of results and benefits for MDOT
• Meet federal regulations • Save money • Faster program delivery • Michigan legislative support • Potential for additional funding • Better decision to support project selection • Less staff time • Improved forecasting • Flexible system

Appendix 5.6

Michigan DOT Research Summit

Breakout Group #6 – Mobility

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7) How can the Road Weather Information System be improved? Where can MDOT fix and improve its operations using existing data and project information?

Specific problem to address, question to answer or information needed
• Proactive approach • Inadequate system, surface sensors • Forecasting of road conditions and maintenance needs • Lack of resources • Driver education/expectations • Link with travel information, see #3 above • Do we have environmental options to salt • Timing of application
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
• Work with current pooled fund studies • Best practices • Invest in alternate de-icing material research • Before and after studies • Early detection technologies • Forecasting models • Driver education campaign
Expected implementation of results and benefits for MDOT
• Lower costs • Improved safety • Better use of resource • Environmental friendly • Happier public • Fewer cars in the ditches, user costs reduced

Michigan DOT Research Summit

Breakout Group #6 – Mobility

8) How can very light jets reduce road usage? ***(Identified as a long-term need.)***

Specific problem to address, question to answer or information needed
• Available airports with meeting facilities • Alternate transportation • Cost effective day trips (four hours or less) • Dollars or time • Ad-hoc routes • Scheduled routes • Match of supply and demand • Local facilities
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
• Identify usage patterns, current demand • Identify vendors • Best practices • Cost analysis
Expected implementation of results and benefits for MDOT
• Provide flexible travel options • Increased economic benefits • New travel services • New business • New airport locations

Appendix 5.7

Michigan DOT Research Summit

Breakout Group #7 – Mobility

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1) What new solutions will mitigate congestion? Possibilities include managed lanes, high-occupancy vehicle lanes, high-occupancy tolling, and others. The department should look at how to apply these solutions to major corridors in urban areas of Michigan.

Specific problem to address, question to answer or information needed
The traditional mechanism for mitigating congestion is adding lanes. This mechanism is no longer viable due to cost (construction, time, finding ROW, etc.). New mechanisms to mitigate congestion need to be identified and implemented. The problem being that the system lacks capacity to address demand High congestion How to keep from building roads - spreading traffic – dynamic routing It's hard to convert regular lanes to HOV lanes How do we implement congestion pricing Demand management Information dissemination (getting information to the user) Definition of congestion Traffic incident management Work zone management How to apply transit solutions ITS Driver incentives – none right now
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
Determine the level of potential of the various strategies listed above. Use modeling to determine which approach to use first. Evaluate implementation barriers for each strategy. There are so many options available, an iterative approach is necessary.
Expected implementation of results and benefits for MDOT
This would result in many research projects. A research problem may be a corridor, tactic or strategy. Toolbox of congestion mitigation strategies and implementation guidelines for those strategies with cost benefit analysis Prioritization of research at MDOT

Appendix 5.7

Michigan DOT Research Summit

Breakout Group #7 – Mobility

2) What next-generation models of travel demands can MDOT use in the future?

Specific problem to address, question to answer or information needed
There is a lot of next generation models available and no clear direction as to which model is the best for MDOT to use. Each model requires different data.
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
Survey of all the different models available and provide pros & cons, data needed of each model and map to domain expertise applicability.
Expected implementation of results and benefits for MDOT
Find most appropriate tool to use.

Appendix 5.7

Michigan DOT Research Summit

Breakout Group #7 – Mobility

3) How effective is the park and ride program? Issues to consider include demand, location, integration with transit (including intercity), and future direction of the program (future growth, new locations).

Specific problem to address, question to answer or information needed
We do not know how effective park & ride programs are. Does the current data give us the information that we need to determine the effectiveness. What impact do the park & ride programs have on mobility? Need to know what improvements need to be made to improve effectiveness. Do the users have the information where they can park & ride and what the available capacity is.
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
Review current program Survey – why they are used, why they are not Use tools (such as cameras, remote sensing and on-the-ground observers) to take survey & information and determine the impact on mobility
Expected implementation of results and benefits for MDOT
Information on the value added and cost to both the users and the owners for better decision-making and application.

Appendix 5.7

Michigan DOT Research Summit

Breakout Group #7 – Mobility

4) As part of the performance measurement for the entire transportation system, what is the appropriate role and what are the best practices for MDOT in measuring and defining performance of local transit systems?

Specific problem to address, question to answer or information needed
Defining the role of transit (is it an opportunity not to drive, facility for those who don't have transportation, economic development driver, congestion relief, environmental, saves energy consumption, etc.)
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
Define the role of transit and develop performance measures MDOT wants to evaluate.
Expected implementation of results and benefits for MDOT
Improve transit planning & investment Improve public policy related to transit

Appendix 5.7

Michigan DOT Research Summit

Breakout Group #7 – Mobility

5) What is MDOT's role in serving as a comprehensive source of transportation information to users (including local and private transit)? What is MDOT's role in mobility management?

Specific problem to address, question to answer or information needed
Where is the limit for providing travel information between MDOT & the private sector and other public entities? Define travel information as congestion issues, available types of transportation, and safety. How we collect data, how we manage the data and how we disseminate data to the user. How do you provide real time conditions & options across all modes?
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
Determine what information needed by travelers, managers and other stakeholders Survey other DOT's Need cost estimates Convene a group that represent the other sectors Request for interest to private sector for data use Determine what format is necessary to disseminate the data
Expected implementation of results and benefits for MDOT
Develop a strategy/plan for providing information to the transportation users based on research results Improve traveler information for mobility at a minimal cost to MDOT

Appendix 5.7

Michigan DOT Research Summit

Breakout Group #7 – Mobility

6) For intercity regional public transportation (air versus rail), what is MDOT's role in developing and supporting the modes? *(Identified as a long-term need.)*

Specific problem to address, question to answer or information needed
Current rail and air transportation lack connectivity to final destination or origin. Is it MDOT's role to provide that connectivity. Does MDOT have a role to oversee privately owned air & rail services. Do WE (MDOT, public, other government agencies) know the best approach to provide intercity transportation (air, rail buses, etc.). Should MDOT change our design standards to support intercity rail facilities?
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
Study stuff
Expected implementation of results and benefits for MDOT
Learn stuff

Appendix 5.8

Michigan DOT Research Summit

Breakout Group #8 – Environmental Accountability

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1) What are the likely impacts of global warming and climate change in Michigan, and how can they be accommodated it as they happen? What is transportation's environmental footprint, both for MDOT as an organization and throughout its programs? ***(Identified as both a short-term and long-term need.)***

Specific problem to address, question to answer or information needed
How does a changing climate alter planning and engineering assumptions Global warming maintenance routines What specific global warming predictions are we going to base our operations Design and sensitivity of design parameters Field assessment Quantification and qualification of MDOT's environmental footprint
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
Data collection in support of climate changes and building a database Collect it as well as interpret it Translate regional climate predictions into MDOT specific impacts
Expected implementation of results and benefits for MDOT
Planning tool for where we are going, cost benefit, optimal maintenance operations

Appendix 5.8

Michigan DOT Research Summit

Breakout Group #8 – Environmental Accountability

2) How do changes in practice impact the environment—when and how does one variable affect another? This is an ongoing concern.

Specific problem to address, question to answer or information needed
Are the new environmental friendly materials as they are supposed to? Lack of environmental assessment of pollutions
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
Field and laboratory testing Demo trials Before and after testing Long term monitoring
Expected implementation of results and benefits for MDOT
Smaller environmental imprint Reducing maintenance costs Better efficiency

3) How do winter maintenance operations (such as salt use and its application) impact the environment?

Specific problem to address, question to answer or information needed
Don't know what our current practice is doing long term Are there alternatives to salt and chemicals Can the salt be collected and reused? Migration of deicer and extent of impact
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
Evaluate current use Field test current Demos Integrated assessments
Expected implementation of results and benefits for MDOT
Reduced environmental impact Cost savings Increased pavement life and structures Improved safety

Appendix 5.8

Michigan DOT Research Summit

Breakout Group #8 – Environmental Accountability

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4) How can MDOT apply "greening" goals and develop recommendations for the whole transportation system (rail, transit, etc.)?

Specific problem to address, question to answer or information needed
What greening goals is MDOT trying to meet How can MDOT improve our goals to apply best management practices What is going on globally and apply those to our transportation systems Where can we partner green goals with leverage How do carbon footprint, air quality, etc goals impact MDOT
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
Field testing and re testing New technologies Assessments of international BMPs Long term evaluation Quantify and reevaluate Optimal design of integrated regional transportation plans
Expected implementation of results and benefits for MDOT
Reduced fuel consumption Meet upcoming federal mandates Reduce environmental impacts Increased efficiency and reduced cost

Appendix 5.8

Michigan DOT Research Summit

Breakout Group #8 – Environmental Accountability

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5) What is the overall environmental impact across all of MDOT's transportation modes?

Specific problem to address, question to answer or information needed
Quantify and qualify environmental impacts of all modes of transportation and also of MDOT in particular Lack of sufficient and timely data Lack of research in this area Lack of data collection
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
Have MDOT coordinate collection of data from diverse sources Data collection and analysis Surveys Need for assessments Partnering
Expected implementation of results and benefits for MDOT
Obtain a baseline of MDOT's environmental impact Be able to assess alternatives Developing partnerships and buy-in

6) How can MDOT help develop industry and jobs in Michigan based on alternative fuel technologies (such as new bus designs)?

Specific problem to address, question to answer or information needed
What is the baseline industry at this time Who are the alternative energy players and stakeholders in Michigan What infrastructure is needed for alternative transportation/energy What funding is available Develop partnerships with private sector What are the impacts of Alternative energy/transportation fuels
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
Data analysis MDOT partnering with universities and private sector Field and lab testing Surveys Before and after studies
Expected implementation of results and benefits for MDOT
Economic growth Reduced fuel consumption Reduced environmental impact Alternative fuels leader

Appendix 5.8

Michigan DOT Research Summit

Breakout Group #8 – Environmental Accountability

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7) What alternative fuel research should MDOT conduct? This may involve working with the private sector, which could then develop alternatives for MDOT's fleet. ***(Identified as a long-term need.)***

Specific problem to address, question to answer or information needed
Lack of current data with regard to fuel efficiencies and alternative fuels How cost effective is hybrid technologies for the MDOT fleet How is cost effective is alternative fuels Define the benefits of alternative fuels What will the impacts of alternative fuel affect MDOT's operations Infrastructure design affected fuel efficiencies and energy conservation
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
Partner with universities and private sector to maintain test of alternative fuel vehicles Lab testing with alternative fuels Modeling of potential impacts Life cycle analysis
Expected implementation of results and benefits for MDOT
Be a leader in this research area Attract new investments in the state Retain population/tax base Identifying impacts to MDOT/state of alternative fuels

Appendix 5.8

Michigan DOT Research Summit

Breakout Group #8 – Environmental Accountability

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8) How does a changing energy policy affect transportation? This includes alternative fuels and methods, as well as the related issues on taxation, use, and application to transportation policy. ***(Identified as a long-term need.)***

Specific problem to address, question to answer or information needed
Energy policy uncertainty Lack of any knowledge Need to identify what Michigan has to offer What will the changes be in transportation system to compensate the high cost of energy Need assessment of effectiveness of global energy policy initiatives
Research approach (data analysis, field or lab testing, surveys, before and after studies, etc.)
Surveys Discussions with international, federal, state officials Regional partnering Working with TRB and AASHTO committees
Expected implementation of results and benefits for MDOT
Improved understanding of what the policies are going to be Improved investments in Michigan Better planning for where we need to be in the future